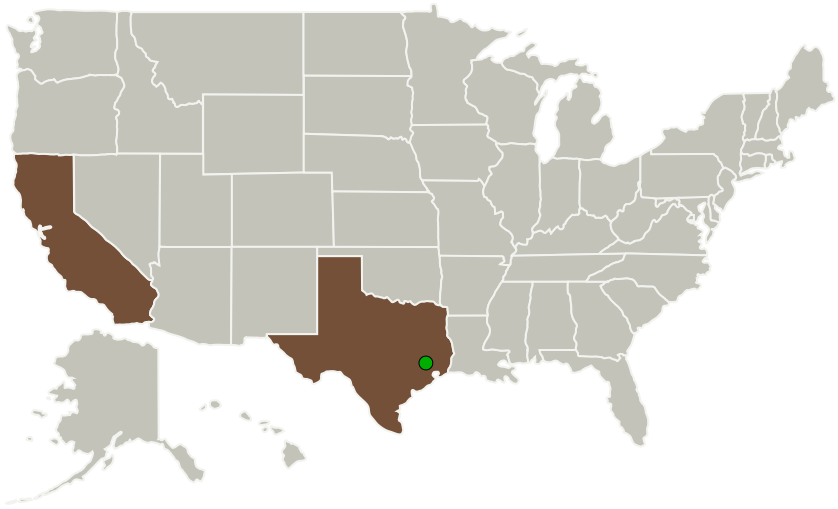
Optical Sensors for Hydrogen and Oxygen for Unambiguous Detection in Their Mutual Presence, Phase I

Completed Technology Project (2011 - 2011)

Project Introduction

The objective of the Phase I SBIR project is to develop sensors that can discriminate the presence of combustible gases like oxygen (O2) in hydrogen (H2) or H2 in O2 backgrounds. These sensors will meet NASA applications for on-orbit crew and mission safety. Currently, H2 and O2 are produced by electrolysis of water. The O2 is used in the environmental control and life support systems (ECLSS) of spacecraft while the hydrogen is vented. H2 is a flammable gas while oxygen aids in combustion. InnoSense LLC (ISL) will utilize its Chemical Fingerprint (TM) sensor array fabrication technology in Phase I to engineer a miniature device with multi-analyte detection capability. The Phase I working model would be evaluated to demonstrate NASA use potential. Upon fine-tuning various parameters in Phase II, the system performance will be tested with a prototype hardware. ISL has received technology endorsement letter from a prime contractor in the NASA application area. For assuring success of this project, ISL has assembled a technical team with a cumulative 60 person-years of experience in developing commercially viable sensor systems.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Innosense, LLC	Lead Organization	Industry Minority-Owned Business, Small Disadvantaged Business (SDB), Women-Owned Small Business (WOSB)	Torrance, California
Johnson Space Center(JSC)	Supporting Organization	NASA Center	Houston, Texas

Primary U.S. Work Locations	
California	Texas

Project Transitions

February 2011: Project Start

September 2011: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/138395)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Innosense, LLC

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

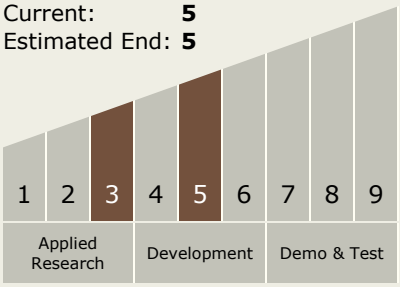
Carlos Torrez

Principal Investigator:

Uma Sampathkumaran

Technology Maturity (TRL)

Start: **3**
Current: **5**
Estimated End: **5**



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Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  - TX06.4 Environmental Monitoring, Safety, and Emergency Response
    - TX06.4.1 Sensors: Air, Water, Microbial, and Acoustic

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System